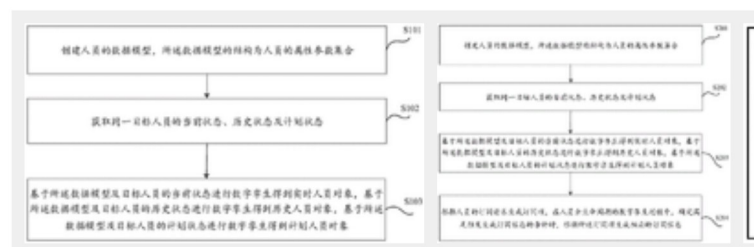# Digital twinning method, device and equipment for personnel full life cycle

Abstract

The application provides a digital twinning method, a digital twinning device and a digital twinning equipment for a full life cycle of personnel, wherein a data model of the personnel is created, and the structure of the data model is an attribute parameter set of the personnel; acquiring the current state, the historical state and the plan state of the same target person; and carrying out digital twinning based on the data model and the current state of the target person to obtain a real-time person object, carrying out digital twinning based on the data model and the historical state of the target person to obtain a historical person object, and carrying out digital twinning based on the data model and the planned state of the target person to obtain a planned person object, so that data modeling of the whole life cycle (real-time, historical and planned) of the person is realized.

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Claims (25) Hide Dependent ∧

1. A method of digital twinning of a full life cycle of a person, the method comprising:

creating a data model of a person, wherein the structure of the data model is an attribute parameter set of the person;

acquiring the current state, the historical state and the plan state of the same target person;

and carrying out digital twinning based on the data model and the current state of the target person to obtain a real-time person object, carrying out digital twinning based on the data model and the historical state of the target person to obtain a historical person object, and carrying out digital twinning based on the data model and the planned state of the target person to obtain a planned person object.

2. The method of claim 1, wherein creating a data model of a person comprises:

obtaining the structure of a data model by determining an attribute parameter set of a person, wherein the attribute parameters in the attribute parameter set of the person comprise an attribute name and a data type;

and initializing the structure of the data model for at least one time to obtain at least one group of predefined data initial values corresponding to the structure of the data model.

3. The method of claim 2, wherein digitally twinning based on the data model and a current state of a target person to obtain a real-time person object, digitally twinning based on the data model and a historical state of the target person to obtain a historical person object, and digitally twinning based on the data model and a planned state of the target person to obtain a planned person object, comprises:

determining a group of predefined data initial values corresponding to the target personnel, and replacing the determined group of predefined data initial values with attribute parameter values corresponding to the current state of the target personnel to obtain a real-time personnel object;

determining a group of predefined data initial values corresponding to the target person, and replacing the determined group of predefined data initial values with attribute parameter values corresponding to the historical state of the target person to obtain a historical person object;

and determining a group of predefined data initial values corresponding to the target personnel, and replacing the determined group of predefined data initial values with attribute parameter values corresponding to the planning state of the target personnel to obtain a planning personnel object.

4. The method of claim 1, wherein the set of attribute parameters for the person includes a time attribute, wherein:

the time attribute of the real-time personnel object is used for recording the state of the personnel at the latest change moment;

the time attribute of the historical personnel object is used for recording the state of each change moment of the personnel in the past;

the time attribute of the planner object is used to record the status of the person at a future time or to record the status of the person over a duration of time beginning at a future time.

5. The method of claim 1 or 2, further comprising:

recording the obtained attribute parameter value of a real-time personnel object to obtain a real-time personnel object record corresponding to a target personnel;

recording the obtained attribute parameter value of a historical personnel object to obtain a historical personnel object record corresponding to a target personnel;

recording the obtained attribute parameter value of a planning personnel object to obtain a planning personnel object record corresponding to a target personnel;

and the personnel object identifications of the real-time personnel object record, the historical personnel object record and the planned personnel object record of the same target personnel are the same.

6. The method of claim 5, wherein recording the obtained attribute parameter value of a historical person object to obtain a historical person object record corresponding to the target person comprises:

when the current state of the target person is determined to be changed, obtaining the historical state of the target person according to the changed entity state of the target person, determining and recording the attribute parameter values of the historical person object, and obtaining a historical person object record of the corresponding person; or

And determining and recording the attribute parameter values of the historical personnel objects according to the historical state of the target personnel predefined by the user to obtain a historical personnel object record of the corresponding personnel.

7. The method of claim 5, wherein recording the obtained attribute parameter values of a planned human object to obtain a planned human object record for the target human comprises:

and according to the planning state of the target person predefined by the user, determining and recording the attribute parameter values of the planning person object to obtain a planning person object record of the corresponding person.

8. The method of claim 3, further comprising:

replacing the determined set of predefined data initial values by using the attribute parameter values corresponding to the current state of the target person, and recording the set of attribute parameter values obtained after replacement to obtain real-time person object records of the corresponding persons;

replacing the determined set of predefined data initial values by using the attribute parameter values corresponding to the historical state of the target person, and recording the set of attribute parameter values obtained after replacement to obtain the historical person object record of the corresponding person;

replacing the determined set of predefined data initial values by using the attribute parameter values corresponding to the plan state of the target person, and recording the set of attribute parameter values obtained after replacement to obtain the plan person object record of the corresponding person;

and the personnel object identifications of the real-time personnel object record, the historical personnel object record and the planned personnel object record of the same personnel are the same.

9. The method of claim 8,

the attribute parameter value of the historical state of the target person is determined according to the current state of the target person after the target person changes or the historical state of the target person predefined by a user;

and the attribute parameter value of the planned state of the target person is determined according to the planned state of the target person predefined by the user.

10. The method according to any one of claims 1 to 9, wherein the set of attribute parameters of the person includes the following attribute parameters:

the personnel data model identification is used for uniquely identifying the data model of the corresponding personnel;

the personnel object identification is used for uniquely identifying the corresponding personnel;

the system comprises a predefined identification of a person data model and a set of predefined data initial values for uniquely identifying a corresponding person.

11. The method of claim 1, wherein the set of attribute parameters of the person further comprises:

and the space attribute is used for recording the space where the personnel are located.

12. The method of claim 11, wherein the spatial attributes further comprise at least one of:

the position attribute is used for recording the spatial position of the personnel;

the shape attribute is used for recording the geometric range of the personnel;

the offset attribute is used for recording the offset of the position of the person relative to the positions of other related persons;

and the angle attribute is used for recording the angle of the position of the person rotated relative to the positions of other related persons.

13. The method according to claim 1 or 11, wherein the set of attribute parameters of the person further comprises:

and the position role attribute is used for recording the organization related to the personnel and the position roles of the personnel in the organization.

14. A people subscription method, characterized in that the method comprises:

creating a data model of a person, wherein the structure of the data model is an attribute parameter set of the person;

acquiring the current state, the historical state and the plan state of the same target person;

performing digital twinning based on the data model and the current state of the target person to obtain a real-time person object, performing digital twinning based on the data model and the historical state of the target person to obtain a historical person object, and performing digital twinning based on the data model and the planned state of the target person to obtain a planned person object;

and generating subscription items according to the subscription requests of the personnel, and generating corresponding subscription information according to the subscription items when determining that the conditions for triggering the generation of the subscription information are met in the digital twin process of the whole life cycle of the personnel.

15. The method of claim 14, wherein determining that a condition triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item comprises:

determining that conditions for triggering generation of subscription information are met when at least one group of predefined data initial values corresponding to the structure of the data model is created, modified or deleted;

and inquiring at least one group of predefined data initial values corresponding to the structure of the data model according to the personnel object identification and the filtering condition or the post role information and the filtering condition in the subscription item, wherein the attribute parameters comprise the personnel object identification or the data which satisfies the filtering condition and has the role of the personnel in the relevant

organization consistent with the post role information, and the subscription information matched with the subscription request is obtained.

16. The method of claim 15, wherein when determining that a condition triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item further comprises:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and when determining that the attribute parameters of the created, modified or deleted personnel object comprise the personnel object identification or the post role information in the subscription item, inquiring data which meets the filtering condition in the corresponding subscription item in the created, modified or deleted personnel object to obtain subscription information matched with the subscription request.

17. The method of claim 14, wherein determining that a condition triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item comprises:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and when determining that the attribute parameters of the created, modified or deleted person object comprise the predefined identifications in the subscription items, inquiring data meeting the filter conditions in the corresponding subscription items in the created, modified or deleted person object to obtain subscription information matched with the subscription request.

18. The method of claim 14, wherein determining that a condition triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item comprises:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and determining the organization to which the person belongs according to the organization attribute of the created, modified or deleted person object, and inquiring data meeting the filtering condition in the corresponding subscription item in the created, modified or deleted person object when the organization attribute is consistent with the organization identifier in the subscription item to obtain subscription information matched with the subscription request.

19. The method of claim 14, wherein determining that a condition triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item comprises:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and inquiring the data in the created, modified or deleted personnel object which meets the corresponding subscription item when the space where the personnel is located is determined to be in the range of the attributive space in the subscription item according to the space attribute of the organization attribute of the created, modified or deleted personnel object, and obtaining the subscription information matched with the

subscription request.

20. The method of claim 14, wherein determining that a condition triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item comprises:

when the space attribute is modified in the process of creating, modifying or deleting the personnel object, the condition of triggering and generating subscription information is met, wherein the personnel object comprises a planned personnel object, a real-time personnel object and a historical personnel object;

and when the spatial position relation in the subscription item is generated by determining the spatial position movement trigger of the personnel according to the modified spatial attributes, inquiring data in the created, modified or deleted personnel object which meets the corresponding subscription item to obtain subscription information matched with the subscription request.

21. The method of any one of claims 14 to 20, further comprising:

receiving a personnel query request, wherein the personnel query request comprises a personnel object identifier, a post role attribute, a predefined identifier, an organization identifier, an attribution space range or a space position relation and a filtering field;

and determining subscription information obtained by subscription items comprising the personnel object identification, the post role attribute, the predefined identification, the organization identification, the attribution space range or the space position relationship, and filtering the determined subscription information according to the filtering field to obtain a query result.

22. A full-life-cycle digital twin apparatus for a person, the apparatus comprising:

the system comprises a creating module, a data model generating module and a data analyzing module, wherein the creating module is used for creating a data model of personnel, and the structure of the data model is an attribute parameter set of the personnel;

the acquisition module is used for acquiring the current state, the historical state and the plan state of the same target person;

and the object generating module is used for performing digital twinning on the basis of the data model and the current state of the target person to obtain a real-time person object, performing digital twinning on the basis of the data model and the historical state of the target person to obtain a historical person object, and performing digital twinning on the basis of the data model and the planned state of the target person to obtain a planned person object.

23. A person subscription arrangement, characterized in that the arrangement comprises:

the system comprises a creating module, a data model generating module and a data analyzing module, wherein the creating module is used for creating a data model of personnel, and the structure of the data model is an attribute parameter set of the personnel;

the acquisition module is used for acquiring the current state, the historical state and the plan state of the same target person;

the object generation module is used for performing digital twinning on the basis of the data model and the current state of the target person to obtain a real-time person object, performing digital twinning on the basis of the data model and the historical state of the target person to obtain a historical person object, and performing digital twinning on the basis of the data model and the planned state of the target person to obtain a planned person object;

and the subscription module is used for generating subscription items according to the subscription requests of the personnel, and generating corresponding subscription information according to the subscription items when

determining that the conditions for triggering generation of the subscription information are met in the digital twin process of the whole life cycle of the personnel.

24. A full-life cycle of people digital twin apparatus comprising at least one processor; and a memory communicatively coupled to the at least one processor; wherein the memory stores instructions executable by the at least one processor to enable the at least one processor to perform the method of any of claims 1-12 or 14-21.

25. A computer storage medium, characterized in that it stores a computer program for causing a computer to perform method of any of claims 1-12 or 14-21.

Description

Digital twinning method, device and equipment for personnel full life cycle

Technical Field

The application relates to the technical field of target identification, in particular to a digital twinning method, a digital twinning device and a digital twinning device for a full life cycle of people.

Background

With the continuous improvement of the digitization and the automation degree of the internet of things, a Digital Twin technology (abbreviated as DT) is one of subversive technologies which are improved for many times and have huge development, and the heat is continuously improved, so that the Digital Twin technology is considered as one of the key technologies for interconnecting everything.

The digital twin not only is a mirror image of the physical world, but also receives real-time information of the physical world, and the digital twin is required to drive the physical world in real time in turn and evolves to be a foreknowledge, a forensics and even a superbody of the physical world. The growth and development of the digital twin body go through several processes of digitalization, interaction, foreknowledge, inspiration, joint intelligence and the like, wherein the digitalization is a process of digitalizing the physical world, and the process needs to express a physical object as a digital model which can be recognized by a computer and a network. The modeling technology is one of the core technologies of digitization, such as mapping scanning, geometric modeling, grid modeling, system modeling, process modeling, tissue modeling, and the like.

If a high fidelity digital virtual model is to be created, various aspects of the person need to be described, such as twinning a person, and the person's geometric position, attributes, behavior, rules, etc. need to be faithfully reproduced, so a complete digital twin model should be multi-dimensional.

The existing five-dimensional structural model concept indicates that the digital twin comprises 5 dimensions of physical entity, virtual entity, twin data, connection and service. According to the concept of five-dimensional models, current simulation-based modeling techniques, such as 3D graphical modeling, should belong to the dimension of the virtual entity therein. The population of digital twins in the related art can be classified into two modes, namely a general model and a professional model.

Only from the dimension of data, the current data modeling technology for people only relates to people data in a certain state, for example, data modeling is only performed on the historical state of the current people, and data modeling on the whole life cycle of people cannot be realized, so that connection and service for subsequent utilization are affected.

Disclosure of Invention

In order to solve the problem that data modeling of the whole life cycle of personnel cannot be carried out in the prior art, the application provides a digital twinning method, a digital twinning device and digital twinning equipment for the whole life cycle of personnel.

In a first aspect, the present application provides a method of digital twinning of a full life cycle of a person, the method comprising:

creating a data model of a person, wherein the structure of the data model is an attribute parameter set of the

person;

acquiring the current state, the historical state and the plan state of the same target person;

performing digital twinning based on the data model and the current state of the target person to obtain a real-time person object, performing digital twinning based on the data model and the historical state of the target person to obtain a historical person object, and performing digital twinning based on the data model and the planned state of the target person to obtain a planned person object.

In one possible embodiment, a data model of a person is created, comprising:

obtaining the structure of a data model by determining an attribute parameter set of a person, wherein the attribute parameters in the attribute parameter set of the person comprise an attribute name and a data type;

and initializing the structure of the data model for at least one time to obtain at least one group of predefined data initial values corresponding to the structure of the data model.

In one possible embodiment, the performing digital twinning based on the data model and the current state of the target person to obtain a real-time person object, performing digital twinning based on the data model and the historical state of the target person to obtain a historical person object, and performing digital twinning based on the data model and the planned state of the target person to obtain a planned person object includes:

determining a group of predefined data initial values corresponding to the target personnel, and replacing the determined group of predefined data initial values with attribute parameter values corresponding to the current state of the target personnel to obtain a real-time personnel object;

determining a group of predefined data initial values corresponding to the target person, and replacing the determined group of predefined data initial values with attribute parameter values corresponding to the historical state of the target person to obtain a historical person object;

and determining a group of predefined data initial values corresponding to the target personnel, and replacing the determined group of predefined data initial values with attribute parameter values corresponding to the planning state of the target personnel to obtain a planning personnel object.

In one possible embodiment, the set of attribute parameters of the person includes a time attribute, where:

the time attribute of the real-time personnel object is used for recording the state of the personnel at the latest change moment;

the time attribute of the historical personnel object is used for recording the state of each change moment of the personnel in the past;

the time attribute of the planner object is used to record the status of the person at a future time or to record the status of the person over a duration of time beginning at a future time.

In a possible implementation mode, recording the obtained attribute parameter value of a real-time personnel object to obtain a real-time personnel object record corresponding to a target personnel;

recording the obtained attribute parameter value of a historical personnel object to obtain a historical personnel object record corresponding to a target personnel;

recording the obtained attribute parameter value of a planning personnel object to obtain a planning personnel object record corresponding to a target personnel;

and the personnel object identifications of the real-time personnel object record, the historical personnel object record and the planned personnel object record of the same target personnel are the same.

In a possible implementation manner, recording the obtained attribute parameter value of one historical person

object to obtain one historical person object record corresponding to the target person, includes:

when the current state of the target person is determined to be changed, obtaining the historical state of the target person according to the changed entity state of the target person, determining and recording the attribute parameter values of the historical person object, and obtaining a historical person object record of the corresponding person; or

And determining and recording the attribute parameter values of the historical personnel objects according to the historical state of the target personnel predefined by the user to obtain a historical personnel object record of the corresponding personnel.

In a possible implementation manner, the recording the obtained attribute parameter value of one planned person object to obtain one planned person object record corresponding to the target person includes:

and according to the planning state of the target person predefined by the user, determining and recording the attribute parameter values of the planning person object to obtain a planning person object record of the corresponding person.

In one possible implementation mode, after replacing the determined set of predefined data initial values by using the attribute parameter values corresponding to the current state of the target person, recording the set of attribute parameter values obtained after replacement to obtain the real-time person object record of the corresponding person;

replacing the determined set of predefined data initial values by using the attribute parameter values corresponding to the historical state of the target person, and recording the set of attribute parameter values obtained after replacement to obtain the historical person object record of the corresponding person;

replacing the determined set of predefined data initial values by using the attribute parameter values corresponding to the plan state of the target person, and recording the set of attribute parameter values obtained after replacement to obtain the plan person object record of the corresponding person;

and the personnel object identifications of the real-time personnel object record, the historical personnel object record and the planned personnel object record of the same personnel are the same.

In a possible implementation manner, the attribute parameter value of the historical state of the target person is determined according to the changed current state of the target person or according to the historical state of the target person predefined by the user;

and the attribute parameter value of the planned state of the target person is determined according to the planned state of the target person predefined by the user.

In one possible embodiment, the set of attribute parameters of the person includes the following attribute parameters:

the personnel data model identification is used for uniquely identifying the data model of the corresponding personnel;

the personnel object identification is used for uniquely identifying the corresponding personnel;

a predefined identification of the person data model, a set of predefined data initial values for uniquely identifying the corresponding person.

In a possible implementation manner, the attribute parameter set of the person further includes:

and the space attribute is used for recording the space where the personnel are located.

In a possible embodiment, the spatial attributes further include at least one of the following attributes:

the position attribute is used for recording the spatial position of the personnel;

the shape attribute is used for recording the geometric range of the personnel;

the offset attribute is used for recording the offset of the position of the person relative to the positions of other related persons;

and the angle attribute is used for recording the angle of the position of the person relative to the positions of other related persons.

In a possible implementation manner, the attribute parameter set of the person further includes:

and the position role attribute is used for recording the organization related to the personnel and the position roles of the personnel in the organization.

In a second aspect, the present application provides a people subscription method, including:

creating a data model of a person, wherein the structure of the data model is an attribute parameter set of the person;

acquiring the current state, the historical state and the plan state of the same target person;

performing digital twinning based on the data model and the current state of the target person to obtain a real-time person object, performing digital twinning based on the data model and the historical state of the target person to obtain a historical person object, and performing digital twinning based on the data model and the planned state of the target person to obtain a planned person object;

and generating subscription items according to the subscription requests of the personnel, and generating corresponding subscription information according to the subscription items when determining that the conditions for triggering the generation of the subscription information are met in the digital twin process of the whole life cycle of the personnel.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item includes:

when at least one group of predefined data initial values corresponding to the structure of the data model is established, modified or deleted, the condition of triggering generation of subscription information is met;

and inquiring at least one group of predefined data initial values corresponding to the structure of the data model according to the personnel object identification and the filtering condition or the post role information and the filtering condition in the subscription item, wherein the attribute parameters comprise the personnel object identification or the data which has the characteristics that the role of the personnel in the related organization is consistent with the post role information and meets the filtering condition, and obtaining the subscription information matched with the subscription request.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item further includes:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and when determining that the attribute parameters of the created, modified or deleted personnel object comprise the personnel object identification or the post role information in the subscription item, inquiring data which meets the filtering condition in the corresponding subscription item in the created, modified or deleted

personnel object to obtain subscription information matched with the subscription request.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item includes:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and when determining that the attribute parameters of the created, modified or deleted person object comprise the predefined identifications in the subscription items, inquiring data meeting the filter conditions in the corresponding subscription items in the created, modified or deleted person object to obtain subscription information matched with the subscription request.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item includes:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and determining the organization to which the person belongs according to the organization attribute of the created, modified or deleted person object, and inquiring data meeting the filtering condition in the corresponding subscription item in the created, modified or deleted person object when the organization attribute is consistent with the organization identifier in the subscription item to obtain subscription information matched with the subscription request.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item includes:

when determining to create, modify or delete personnel objects, meeting the condition of triggering and generating subscription information, wherein the personnel objects comprise a planned personnel object, a real-time personnel object and a historical personnel object;

and inquiring the data in the created, modified or deleted personnel object which meets the corresponding subscription item when the space where the personnel is located is determined to be in the range of the attributive space in the subscription item according to the space attribute of the organization attribute of the created, modified or deleted personnel object, and obtaining the subscription information matched with the subscription request.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item includes:

when the space attribute is modified in the process of creating, modifying or deleting the personnel object, the condition of triggering and generating subscription information is met, wherein the personnel object comprises a planned personnel object, a real-time personnel object and a historical personnel object;

and when the spatial position relation in the subscription item is generated by determining the spatial position movement trigger of the personnel according to the modified spatial attributes, querying data in the corresponding subscription item which is satisfied in the created, modified or deleted personnel object, and obtaining subscription information matched with the subscription request.

In one possible implementation, a personnel query request is received, wherein the personnel query request comprises a personnel object identifier, a post role attribute, a predefined identifier, an organization identifier, a home space range or a space position relationship, and a filtering field;

and determining subscription information obtained by subscription items comprising the personnel object identification, the post role attribute, the predefined identification, the organization identification, the attribution space range or the space position relationship, and filtering the determined subscription information according to the filtering field to obtain a query result.

In a third aspect, the present application provides a full life-cycle digital twinning device for a person, the device comprising:

the system comprises a creating module, a data model generating module and a data analyzing module, wherein the creating module is used for creating a data model of personnel, and the structure of the data model is an attribute parameter set of the personnel;

the acquisition module is used for acquiring the current state, the historical state and the plan state of the same target person;

and the object generation module is used for performing digital twinning on the basis of the data model and the current state of the target person to obtain a real-time person object, performing digital twinning on the basis of the data model and the historical state of the target person to obtain a historical person object, and performing digital twinning on the basis of the data model and the planned state of the target person to obtain a planned person object.

In a fourth aspect, the present application provides a person subscription apparatus, comprising:

the system comprises a creating module, a data model generating module and a data analyzing module, wherein the creating module is used for creating a data model of personnel, and the structure of the data model is an attribute parameter set of the personnel;

the acquisition module is used for acquiring the current state, the historical state and the plan state of the same target person;

the object generation module is used for performing digital twinning on the basis of the data model and the current state of the target person to obtain a real-time person object, performing digital twinning on the basis of the data model and the historical state of the target person to obtain a historical person object, and performing digital twinning on the basis of the data model and the planned state of the target person to obtain a planned person object;

and the subscription module is used for generating subscription items according to the subscription requests of the personnel, and generating corresponding subscription information according to the subscription items when determining that the conditions for triggering generation of the subscription information are met in the digital twin process of the whole life cycle of the personnel.

In a fifth aspect, the present application provides a full life-cycle human digital twin apparatus comprising at least one processor; and a memory communicatively coupled to the at least one processor; wherein the memory stores instructions executable by the at least one processor to enable the at least one processor to perform the method according to the first aspect or to perform the method according to any of the second aspects.

In a sixth aspect, the present application provides a computer storage medium having stored thereon a computer program for causing a computer to perform the method as defined in the first aspect above or in any one of the second aspects above.

The application provides a digital twinning method, a device and equipment for a person life cycle. The method provided by the embodiment of the application relates to the historical state, the current state and the plan

state of a target person, and realizes data modeling of the whole life cycle of the person.

Drawings

FIG. 1 is a flow diagram illustrating a digital twinning method for a person lifecycle, according to an exemplary embodiment of the present invention;

FIG. 2 is a flowchart illustrating a method for subscribing to people according to an exemplary embodiment of the present invention;

FIG. 3 is a schematic diagram of a digital twinning device for a person lifecycle, exemplary in accordance with an exemplary embodiment of the present invention;

FIG. 4 is a schematic diagram of a person subscription device, according to an example of an illustrative embodiment of the present invention;

FIG. 5 is a schematic diagram of a digital twinning device for a human lifecycle, illustrated in accordance with an exemplary embodiment of the present invention.

Detailed Description

The technical solutions in the embodiments of the present application will be described in detail and clearly with reference to the accompanying drawings. It is to be understood that the embodiments described are only a few embodiments of the present invention, and not all embodiments. All other embodiments, which can be derived by a person skilled in the art from the embodiments given herein without making any creative effort, shall fall within the protection scope of the present invention.

Professional models and tools in the prior art have the advantages of pertinence and the defects of no universality, poor openness and compatibility and incapability of interaction and integration. Only from the dimension of data, the current data modeling technology has the problem that models with the same structure and different parameter values cannot be distinguished; moreover, most of the current subject full-period data only comprise real-time and historical data, and management of prenatal planning data is lacked. In view of the above drawbacks, the present application provides a method for digital twinning of a full life cycle of people, as shown in fig. 1, the method includes:

s101: and creating a data model of the person, wherein the structure of the data model is the attribute parameter set of the person.

And creating a data model for the personnel, wherein the personnel can comprise a current state, a historical state and a planned state according to time attributes, and in order to realize digital twinning of the personnel in the whole life cycle, the digital twinning is respectively carried out according to different states of the personnel. When a person data model is created, the structure of the person data model can be obtained by determining a person attribute parameter set, wherein attribute parameters in the person attribute parameter set comprise attribute names and data types.

In one possible embodiment, a data model of a person is created, comprising:

obtaining the structure of a data model by determining an attribute parameter set of a person, wherein the attribute parameters in the attribute parameter set of the person comprise an attribute name and a data type;

and initializing the structure of the data model for at least one time to obtain at least one group of predefined data initial values corresponding to the structure of the data model.

And predefining at least recording a specific numerical value of one attribute parameter of the data model of the corresponding person, and determining to perform predefined operation or not according to the requirement of a user.

S102: and acquiring the current state, the historical state and the plan state of the same target person.

In order to carry out a complete period of digital twinning on the personnel, the state of the personnel is divided into a current state, a historical state and a plan state, wherein the state refers to the specific numerical value of each attribute parameter in the attribute parameter set of the personnel at the corresponding moment.

S103: performing digital twinning based on the data model and the current state of the target person to obtain a real-time person object, performing digital twinning based on the data model and the historical state of the target person to obtain a historical person object, and performing digital twinning based on the data model and the planned state of the target person to obtain a planned person object.

The embodiment provided by the application is used for carrying out digital twinning on the whole life cycle of a person to obtain the person object, so that the state of the person is divided into a current state, a historical state and a planned state. And respectively carrying out retrograde digital twins on different state levels of the personnel to obtain personnel objects corresponding to the personnel, wherein the personnel objects specifically comprise a real-time personnel object, a historical personnel object and a planning personnel object.

The real-time personnel object represents that digital twinning is carried out on the state of personnel when the personnel changes last time to obtain a real-time personnel object; the historical personnel object represents that the historical personnel object is obtained by carrying out digital twinning on the state of the personnel when the personnel changes every time in the past; the projected person object represents a historical person object obtained by digitally twinning the person's state at some future time.

In one possible embodiment, digitally twinning a real-time person object based on the data model and a current state of a target person comprises:

and determining a group of predefined data initial values corresponding to the target personnel, and replacing the determined group of predefined data initial values with the attribute parameter values corresponding to the current state of the target personnel to obtain the real-time personnel object.

Performing digital twinning based on the data model and the historical state of the target person to obtain a historical person object, comprising:

and determining a group of predefined data initial values corresponding to the target person, and replacing the determined group of predefined data initial values with attribute parameter values corresponding to the historical state of the target person to obtain a historical person object.

Performing digital twinning based on the data model and the planning state of the target person to obtain a planning person object, comprising:

and determining a group of predefined data initial values corresponding to the target personnel, and replacing the determined group of predefined data initial values with attribute parameter values corresponding to the planning state of the target personnel to obtain a planning personnel object.

According to the method provided by the embodiment of the application, the same data model is built for the target person, and one or more groups of initial values are defined for the same data model, so that the problem that multiple models cannot be built in the existing modeling stage due to the fact that the multiple models are built due to the fact that the multiple models are identical in structure and different in parameter values cannot be distinguished.

It should be noted that, as described in the above S102, the predefined operation may be performed or may not be performed according to the requirement of the user. If the predefined operation is not carried out, the attribute parameter values of the target personnel can be directly used for obtaining real-time personnel objects, historical personnel objects and planning personnel objects.

According to the digital twinning method for the life cycle of the personnel, the data model of the personnel is

created, digital twinning is carried out based on the data model and the current state of the personnel to obtain the real-time personnel object, digital twinning is carried out based on the data model and the historical state of the personnel to obtain the historical personnel object, digital twinning is carried out based on the data model and the planned state of the personnel to obtain the planned personnel object, and data modeling of the whole life cycle of the personnel is achieved.

The attribute parameters of the person in S101 specifically include at least one of the following:

the time attribute is as follows: in a possible implementation manner, the time attribute of the real-time person object is used for recording the state of the person at the last change time;

the time attribute of the historical personnel object is used for recording the state of each change moment of the personnel in the past;

the time attribute of the planner object is used to record the status of the person at a future time or to record the status of the person over a duration of time beginning at a future time.

The personnel data model identification is used for uniquely identifying the data model of the corresponding personnel;

the personnel object identification is used for uniquely identifying the corresponding personnel;

the system comprises a predefined identification of a person data model and a set of predefined data initial values for uniquely identifying a corresponding person.

Spatial attributes: the space attribute is used for recording the space where the person is located, and comprises at least one of the following properties:

the position attribute is used for recording the spatial position of the personnel;

the shape attribute is used for recording the geometric range of the personnel;

the offset attribute is used for recording the offset of the position of the person relative to the positions of other related persons;

and the angle attribute is used for recording the angle of the position of the person rotated relative to the positions of other related persons.

The position role attribute: for recording the organization associated with the person and the role of the person in the organization.

For example, if a person doubles as two roles in organization OA, namely position role RA and RB, and plays the position role RA in organization OB, the contents of the organization position role list attribute of the person object can be shown as follows:

```
{

    "OA" :[ "RA" ," RB" ];

    "OB" :[" RA" ];

}
```

in the above example, the organization and the post roles are represented by names, but in an actual implementation process, the present invention is not limited to this example, and the object identifier may be used as long as the object identifier includes information of a plurality of post roles in the organization and the organization or a plurality of organizations.

After the person object is obtained by performing digital twinning based on the data model and different states of the person in S103, the parameter value of the person object may be recorded to obtain a corresponding person object record, which may specifically be implemented as follows:

the person object record is used for describing the person object, and specifically comprises the following steps:

(1) real-time person object recording.

Recording the obtained attribute parameter value of a real-time person object to obtain a real-time person object record corresponding to a target person, wherein the method comprises the following steps:

determining and recording attribute parameter values of real-time personnel objects according to the current state of target personnel predefined by a user to obtain a real-time personnel object record of corresponding personnel; or

And after replacing the determined group of predefined data initial values by using the attribute parameter values corresponding to the current state of the target person, recording the group of attribute parameter values obtained after replacement to obtain the real-time person object record of the corresponding person.

And the attribute parameter value of the current state of the target person is determined according to the current state of the target person predefined by the user.

(2) Historical person object records.

Recording the obtained attribute parameter value of a historical personnel object to obtain a historical personnel object record corresponding to a target personnel, wherein the method comprises the following steps:

when the current state of the target person is determined to be changed, obtaining the historical state of the target person according to the changed entity state of the target person, determining and recording the attribute parameter values of the historical person object, and obtaining a historical person object record of the corresponding person; or

Determining and recording attribute parameter values of historical personnel objects according to the historical state of target personnel predefined by a user to obtain a historical personnel object record of corresponding personnel; or

And after replacing the determined group of predefined data initial values by using the attribute parameter values corresponding to the historical state of the target person, recording the group of attribute parameter values obtained after replacement to obtain the historical person object record of the corresponding person.

And the attribute parameter value of the historical state of the target person is determined according to the current state of the target person after the target person changes, or is determined according to the historical state of the target person predefined by the user.

(3) Planning personnel object records.

Recording the obtained attribute parameter value of one planning personnel object to obtain a planning personnel object record corresponding to a target person, wherein the method comprises the following steps:

determining and recording the attribute parameter values of the planned personnel object according to the planned state of the target personnel predefined by the user to obtain a planned personnel object record of the corresponding personnel; or

And replacing the determined group of predefined data initial values by using the attribute parameter values corresponding to the plan state of the target person, and recording the group of attribute parameter values obtained after replacement to obtain the plan person object record of the corresponding person.

And the attribute parameter value of the planned state of the target person is determined according to the planned state of the target person predefined by the user.

And the personnel object identifications of the real-time personnel object record, the historical personnel object record and the planned personnel object record of the same personnel are the same.

Based on the same inventive concept, the present application provides a person subscription method, as shown in fig. 2, the method includes:

s201: and creating a data model of the person, wherein the structure of the data model is the attribute parameter set of the person.

S202: and acquiring the current state, the historical state and the planned state of the same target person.

S203: and carrying out digital twinning based on the data model and the current state of the target person to obtain a real-time person object, carrying out digital twinning based on the data model and the historical state of the target person to obtain a historical person object, and carrying out digital twinning based on the data model and the planned state of the target person to obtain a planned person object.

The specific embodiments of S201 to S203 are as described above, and are not described herein again.

S204: and generating subscription items according to the subscription requests of the personnel, and generating corresponding subscription information according to the subscription items when determining that the conditions for triggering the generation of the subscription information are met in the digital twin process of the whole life cycle of the personnel.

After receiving a subscription request containing 'personnel object identification', the time-space database generates subscription items, wherein the subscription items comprise the personnel object identification and the filtering condition.

The method comprises the steps that a time-space database is pre-established, a personnel object identifier is associated with a subscription item of a predefined data initial value, a personnel object identifier is associated

with a subscription item of a predefined instantiated personnel object, and a personnel object identifier is associated with a subscription item of data generated by the predefined instantiated personnel object.

In a digital twin process of a full lifecycle of a person, a person object record may be subscribed to according to a subscription request of the person. The conditions for triggering the generation of the subscription information include at least one of:

(1) determining that a condition for triggering generation of subscription information is satisfied when at least one set of predefined initial data values corresponding to a structure of the data model is created, modified or deleted.

In the twin process of people, when the creation of a person object is found, whether a subscription item corresponding to the object identification of the person exists is inquired, and if the subscription item exists, the creation event of the person object is published.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item includes:

determining that conditions for triggering generation of subscription information are met when at least one group of predefined data initial values corresponding to the structure of the data model is created, modified or deleted;

and inquiring at least one group of predefined data initial values corresponding to the structure of the data model according to the personnel object identification and the filtering condition or the post role information and the filtering condition in the subscription item, wherein the attribute parameters comprise the personnel object identification or the data which satisfies the filtering condition and has the role of the personnel in the relevant organization consistent with the post role information, and the subscription information matched with the subscription request is obtained.

And after receiving the subscription request, the database stores the subscription item information, including the object identifier and the filtering condition, or the post role information and the filtering condition. And inquiring information of all the object identifications or information that the roles of the personnel in the related organizations are consistent with the role information of the posts. And if the subscription item has a filtering condition, judging whether the object meets the filtering condition, if so, issuing the identification and name information of the personnel object, and if not, not issuing.

(2) And when the person object is determined to be created, modified or deleted, the condition for triggering the generation of the subscription information is met.

In the twin process of people, when the creation of a person object is found, whether a subscription item corresponding to the person object identification of the person object exists is inquired, and if the subscription item exists, the person object creation event is published.

When the person object is modified or deleted, the person object modification event and the person object deletion event are issued.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item includes:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and when determining that the attribute parameters of the created, modified or deleted personnel object

comprise the personnel object identification or the post role information in the subscription item, inquiring data which meets the filtering condition in the corresponding subscription item in the created, modified or deleted personnel object to obtain subscription information matched with the subscription request.

And after receiving the subscription request, the database stores the subscription item information, including the object identifier and the filtering condition, or the post role information and the filtering condition. And inquiring information of all the object identifications or information that the roles of the personnel in the related organizations are consistent with the role information of the posts. And if the subscription item has a filtering condition, judging whether the object meets the filtering condition, if so, issuing the object identification and the name information or the post role information of the publisher, and if not, not issuing.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item includes:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and when determining that the attribute parameters of the created, modified or deleted person object comprise the predefined identifications in the subscription items, inquiring data meeting the filter conditions in the corresponding subscription items in the created, modified or deleted person object to obtain subscription information matched with the subscription request.

And after receiving the subscription request, the database stores the subscription item information, including the predefined identification and the filtering condition. All the predefined identified information is queried. If the subscription item has a filtering condition, judging whether the object meets the filtering condition, if so, issuing the predefined identification and name information of the publisher, and if not, not issuing.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item includes:

when determining to create, modify or delete personnel objects, meeting the condition of triggering and generating subscription information, wherein the personnel objects comprise a planned personnel object, a real-time personnel object and a historical personnel object;

and determining the organization to which the person belongs according to the organization attribute of the created, modified or deleted person object, and inquiring data meeting the filtering condition in the corresponding subscription item in the created, modified or deleted person object when the organization attribute is consistent with the organization identifier in the subscription item to obtain subscription information matched with the subscription request.

And after receiving the subscription request, the database stores the subscription item information, including the organization identifier and the filtering condition. All information of the organization identity is queried. And if the subscription item has the filtering condition, judging whether the object meets the filtering condition, if so, issuing the organization identification and name information of the publisher, and if not, not issuing.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item includes:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and inquiring the data in the created, modified or deleted personnel object which meets the corresponding subscription item when the space where the personnel is located is determined to be in the range of the attributive space in the subscription item according to the space attribute of the organization attribute of the created, modified or deleted personnel object, and obtaining the subscription information matched with the subscription request.

After receiving the subscription request, the database stores the subscription item information, including the space range and the filtering condition, inquires all personnel object records in the space range, if the subscription item has the filtering condition, judges whether the object meets the filtering condition, if so, publishes the space range and name information of the personnel, and if not, publishes the information.

(3) And when the space attribute is modified in the process of creating, modifying or deleting the personnel object, the condition for triggering the generation of the subscription information is met.

In a possible implementation manner, when it is determined that a condition for triggering generation of subscription information is satisfied, generating corresponding subscription information according to the subscription item includes:

when the space attribute is modified in the process of creating, modifying or deleting the personnel object, the condition of triggering and generating subscription information is met, wherein the personnel object comprises a planned personnel object, a real-time personnel object and a historical personnel object;

and when the spatial position relation in the subscription item is generated by determining the spatial position movement trigger of the personnel according to the modified spatial attributes, inquiring data in the created, modified or deleted personnel object which meets the corresponding subscription item to obtain subscription information matched with the subscription request.

After receiving the subscription request, the database stores the subscription item information, including the location identifier and the filtering condition, and when the person object is created or moved from the old location to the new location, the location attribute of the person object needs to be set. And querying all the subscription items of which all the position identifications are the new position identifications, if so, judging whether the object meets the filtering condition in the subscription item, if so, issuing the position identifications and the name information of the issuing personnel, and if not, issuing. The attribute values of the delete person object and the modify person object include member values.

In one possible implementation, a personnel query request is received, wherein the personnel query request comprises a personnel object identifier, a post role attribute, a predefined identifier, an organization identifier, a home space range or a space position relationship, and a filtering field;

and determining subscription information obtained by subscription items comprising the personnel object identification, the post role attribute, the predefined identification, the organization identification, the attribution space range or the space position relationship, and filtering the determined subscription information according to the filtering field to obtain a query result.

When a person object is twinborn, receiving a person query request, setting a person object identifier, a post role attribute, a predefined identifier, an organization identifier, an attribution space range or a space position according to actual conditions, establishing an index according to the person object identifier, the post role attribute, the predefined identifier, the organization identifier, the attribution space range or the space position, and retrieving all the person objects according to the person object identifier, the post role attribute, the predefined identifier, the organization identifier, the attribution space range or the space position information. And filtering all the inquired personnel objects according to the filtering conditions, organizing and sorting data according to the attribute fields required by the user, and returning the organized data to the result finally required by the user.

Based on the phase inventive concept, the embodiment of the present application provides a digital twinning

device of a full life cycle of people, as shown in fig. 3, the device 300 includes:

a creating module 301, configured to create a data model of a person, where a structure of the data model is an attribute parameter set of the person;

an obtaining module 302, configured to obtain a current state, a historical state, and a planned state of the same target person;

and the object generation module 303 is configured to perform digital twinning based on the data model and the current state of the target person to obtain a real-time person object, perform digital twinning based on the data model and the historical state of the target person to obtain a historical person object, and perform digital twinning based on the data model and the planned state of the target person to obtain a planned person object.

In one possible implementation, the creation module 301 is configured to create a data model of a person, including:

obtaining the structure of a data model by determining an attribute parameter set of a person, wherein the attribute parameters in the attribute parameter set of the person comprise an attribute name and a data type;

and initializing the structure of the data model for at least one time to obtain at least one group of predefined data initial values corresponding to the structure of the data model.

In a possible implementation manner, the object generating module 303 is configured to perform digital twinning to obtain a real-time person object based on the data model and the current state of the target person, perform digital twinning to obtain a historical person object based on the data model and the historical state of the target person, and perform digital twinning to obtain a planned person object based on the data model and the planned state of the target person, and includes:

determining a group of predefined data initial values corresponding to the target personnel, and replacing the determined group of predefined data initial values with attribute parameter values corresponding to the current state of the target personnel to obtain a real-time personnel object;

determining a group of predefined data initial values corresponding to the target person, and replacing the determined group of predefined data initial values with attribute parameter values corresponding to the historical state of the target person to obtain a historical person object;

and determining a group of predefined data initial values corresponding to the target personnel, and replacing the determined group of predefined data initial values with attribute parameter values corresponding to the planning state of the target personnel to obtain a planning personnel object.

In one possible implementation, the creating module 301 is configured to create a set of attribute parameters of the person, including a time attribute, wherein:

the time attribute of the real-time personnel object is used for recording the state of the personnel at the latest change moment;

the time attribute of the historical personnel object is used for recording the state of each change moment of the personnel in the past;

the time attribute of the planner object is used to record the status of the person at a future time or to record the status of the person over a duration of time beginning at a future time.

In a possible implementation manner, the recording module is configured to record an obtained attribute parameter value of a real-time person object to obtain a real-time person object record corresponding to a target person;

recording the obtained attribute parameter value of a historical personnel object to obtain a historical personnel

object record corresponding to a target personnel;

recording the obtained attribute parameter value of a planning personnel object to obtain a planning personnel object record corresponding to a target personnel;

and the personnel object identifications of the real-time personnel object record, the historical personnel object record and the planned personnel object record of the same target personnel are the same.

In a possible implementation manner, the recording module is configured to record the obtained attribute parameter value of one historical person object, to obtain one historical person object record corresponding to the target person, and includes:

when the current state of the target person is determined to be changed, obtaining the historical state of the target person according to the changed entity state of the target person, determining and recording the attribute parameter values of the historical person object, and obtaining a historical person object record of the corresponding person; or

And determining and recording the attribute parameter values of the historical personnel objects according to the historical state of the target personnel predefined by the user to obtain a historical personnel object record of the corresponding personnel.

In a possible implementation manner, the recording module is configured to record the obtained attribute parameter value of one planned person object, so as to obtain one planned person object record corresponding to the target person, and includes:

and according to the planning state of the target person predefined by the user, determining and recording the attribute parameter values of the planning person object to obtain a planning person object record of the corresponding person.

In a possible implementation manner, the replacement module is configured to replace the determined set of predefined data initial values with attribute parameter values corresponding to the current state of the target person, and then record a set of attribute parameter values obtained after replacement to obtain a real-time person object record of the corresponding person;

replacing the determined set of predefined data initial values by using the attribute parameter values corresponding to the historical state of the target person, and recording the set of attribute parameter values obtained after replacement to obtain the historical person object record of the corresponding person;

replacing the determined set of predefined data initial values by using the attribute parameter values corresponding to the plan state of the target person, and recording the set of attribute parameter values obtained after replacement to obtain the plan person object record of the corresponding person;

and the personnel object identifications of the real-time personnel object record, the historical personnel object record and the planned personnel object record of the same personnel are the same.

In a possible implementation manner, the determining module is used for determining the attribute parameter value of the historical state of the target person according to the changed current state of the target person or according to the historical state of the target person predefined by the user;

and the attribute parameter value of the planned state of the target person is determined according to the planned state of the target person predefined by the user.

In a possible implementation, the creating module 301 is configured to create a set of attribute parameters of the person, including the following attribute parameters:

the personnel data model identification is used for uniquely identifying the data model of the corresponding personnel;

the personnel object identification is used for uniquely identifying the corresponding personnel;

the system comprises a predefined identification of a person data model and a set of predefined data initial values for uniquely identifying a corresponding person.

In a possible implementation manner, the creating module 301 is configured to create the attribute parameter set of the person, and further includes:

and the space attribute is used for recording the space where the personnel are located.

In a possible implementation, the creating module 301 is configured to create a set of personnel attribute parameters, and the spatial attributes further include at least one of the following attributes:

the position attribute is used for recording the spatial position of the personnel;

the shape attribute is used for recording the geometric range of the personnel;

the offset attribute is used for recording the offset of the position of the person relative to the positions of other related persons;

and the angle attribute is used for recording the angle of the position of the person rotated relative to the positions of other related persons.

In a possible implementation manner, the creating module 301 is configured to create the attribute parameter set of the person, and further includes:

and the position role attribute is used for recording the organization related to the personnel and the position roles of the personnel in the organization.

Based on the same inventive concept, the embodiment of the present application provides a personnel subscription apparatus, as shown in fig. 4, the apparatus 404 includes:

a creating module 401, configured to create a data model of a person, where a structure of the data model is an attribute parameter set of the person;

an obtaining module 402, configured to obtain a current state, a historical state, and a planned state of the same target person;

an object generation module 403, configured to perform digital twinning based on the data model and the current state of the target person to obtain a real-time person object, perform digital twinning based on the data model and the historical state of the target person to obtain a historical person object, and perform digital twinning based on the data model and the planned state of the target person to obtain a planned person object;

the subscription module 404 is configured to generate a subscription item according to a subscription request of a person, and generate corresponding subscription information according to the subscription item when it is determined that a condition for triggering generation of subscription information is met in a digital twin process of a full life cycle of the person.

In a possible implementation manner, the subscription module is configured to generate corresponding subscription information according to the subscription item when determining that a condition for triggering generation of subscription information is satisfied, and includes:

determining that conditions for triggering generation of subscription information are met when at least one group of predefined data initial values corresponding to the structure of the data model is created, modified or deleted;

and inquiring at least one group of predefined data initial values corresponding to the structure of the data model according to the personnel object identification and the filtering condition or the post role information and

the filtering condition in the subscription item, wherein the attribute parameters comprise the personnel object identification or the data which satisfies the filtering condition and has the role of the personnel in the relevant organization consistent with the post role information, and the subscription information matched with the subscription request is obtained.

In a possible implementation manner, the subscription module 404 is configured to, when determining that a condition for triggering generation of subscription information is satisfied, generate corresponding subscription information according to the subscription item, and further include:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and when determining that the attribute parameters of the created, modified or deleted personnel object comprise the personnel object identification or the post role information in the subscription item, inquiring data which meets the filtering condition in the corresponding subscription item in the created, modified or deleted personnel object to obtain subscription information matched with the subscription request.

In a possible implementation manner, the subscription module 404 is configured to, when determining that a condition for triggering generation of subscription information is satisfied, generate corresponding subscription information according to the subscription item, including:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and when the attribute parameters of the created, modified or deleted personnel object are determined to comprise the predefined identification in the subscription item, querying data which meets the filter condition in the corresponding subscription item in the created, modified or deleted personnel object to obtain subscription information matched with the subscription request.

In a possible implementation manner, the subscription module 404 is configured to, when determining that a condition for triggering generation of subscription information is satisfied, generate corresponding subscription information according to the subscription item, including:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and determining the organization to which the person belongs according to the organization attribute of the created, modified or deleted person object, and inquiring data meeting the filtering condition in the corresponding subscription item in the created, modified or deleted person object when the organization attribute is consistent with the organization identifier in the subscription item to obtain subscription information matched with the subscription request.

In a possible implementation manner, the subscription module 404 is configured to, when determining that a condition for triggering generation of subscription information is satisfied, generate corresponding subscription information according to the subscription item, including:

when determining to create, modify or delete a person object, meeting the condition of triggering and generating subscription information, wherein the person object comprises a planned person object, a real-time person object and a historical person object;

and inquiring the data in the created, modified or deleted personnel object which meets the corresponding subscription item when the space where the personnel is located is determined to be in the range of the attributive space in the subscription item according to the space attribute of the organization attribute of the

created, modified or deleted personnel object, and obtaining the subscription information matched with the subscription request.

In a possible implementation manner, the subscription module 404 is configured to, when determining that a condition for triggering generation of subscription information is satisfied, generate corresponding subscription information according to the subscription item, including:

when the space attribute is modified in the process of creating, modifying or deleting the personnel object, the condition of triggering and generating subscription information is met, wherein the personnel object comprises a planned personnel object, a real-time personnel object and a historical personnel object;

and when the spatial position relation in the subscription item is generated by determining the spatial position movement trigger of the personnel according to the modified spatial attributes, inquiring data in the created, modified or deleted personnel object which meets the corresponding subscription item to obtain subscription information matched with the subscription request.

In a possible implementation manner, the subscription module 404 is configured to enable the query module to receive a staff query request, where the staff query request includes a staff object identifier, a post role attribute, a predefined identifier, an organization identifier, a home space range or a space position relationship, and a filter field;

and determining subscription information obtained by subscription items comprising the personnel object identification, the post role attribute, the predefined identification, the organization identification, the attribution space range or the space position relationship, and filtering the determined subscription information according to the filtering field to obtain a query result.

Based on the same inventive concept, the present application provides a human full-life-cycle digital twin apparatus, as shown in fig. 5, comprising at least one processor; and a memory communicatively coupled to the at least one processor; wherein the memory stores instructions executable by the at least one processor to enable the at least one processor to perform any of the above embodiments of the method of digital twin or person subscription for a full life cycle of a person.

The electronic device 130 according to this embodiment of the present application is described below with reference to fig. 5. The electronic device 130 shown in fig. 5 is only an example, and should not bring any limitation to the functions and the scope of use of the embodiments of the present application.

As shown in fig. 5, the electronic device 130 is represented in the form of a general electronic device. The components of the electronic device 130 may include, but are not limited to: the at least one processor 131, the at least one memory 132, and a bus 133 that connects the various system components (including the memory 132 and the processor 131).

The processor 131 is configured to read and execute instructions in the memory 132, so that the at least one processor can execute a human full-life digital twin method or a human subscription method provided by the above embodiments.

Bus 133 represents one or more of any of several types of bus structures, including a memory bus or memory controller, a peripheral bus, a processor, or a local bus using any of a variety of bus architectures.

The memory 132 may include readable media in the form of volatile memory, such as Random Access Memory (RAM)1321 and/or cache memory 1322, and may further include Read Only Memory (ROM) 1323.

Memory 132 may also include programs/utilities 1325 having a set (at least one) of program modules 1324, such program modules 1324 including but not limited to: an operating system, one or more application programs, other program modules, and program data, each of which, or some combination thereof, may comprise an implementation of a network environment.

The electronic device 130 may also communicate with one or more external devices 134 (e.g., keyboard, pointing device, etc.), with one or more devices that enable a user to interact with the electronic device 130, and/or with any devices (e.g., router, modem, etc.) that enable the electronic device 130 to communicate with one or more other electronic devices. Such communication may occur via input/output (I/O) interfaces 135. Also, the electronic device 130 may communicate with one or more networks (e.g., a Local Area Network (LAN), a Wide Area Network (WAN), and/or a public network, such as the internet) via the network adapter 136. As shown, network adapter 136 communicates with other modules for electronic device 130 over bus 133. It should be understood that although not shown in the figures, other hardware and/or software modules may be used in conjunction with electronic device 130, including but not limited to: microcode, device drivers, redundant processors, external disk drive arrays, RAID systems, tape drives, and data backup storage systems, among others.

In some possible embodiments, various aspects of a human full-life-cycle digital twinning method provided herein may also be implemented in the form of a program product comprising program code means for causing a computer device to carry out the steps of a human full-life-cycle digital twinning method or a human subscription method described above in accordance with various exemplary embodiments of the present application, when the program product is run on a computer device.

In addition, the present application also provides a computer-readable storage medium storing a computer program for causing a computer to execute the method of any one of the above embodiments.

These computer program instructions may be stored in a computer-readable memory that can direct a computer or other programmable data processing apparatus to function in a particular manner, such that the instructions stored in the computer-readable memory produce an article of manufacture including instruction means which implement the function specified in the flowchart flow or flows and/or block diagram block or blocks.

These computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operation steps to be performed on the computer or other programmable apparatus to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the functions specified in the flowchart flow or flows and/or block diagram block or blocks.

While the preferred embodiments of the present application have been described, additional variations and modifications in those embodiments may occur to those skilled in the art once they learn of the basic inventive concepts. Therefore, it is intended that the appended claims be interpreted as including preferred embodiments and all alterations and modifications as fall within the scope of the application.

It will be apparent to those skilled in the art that various changes and modifications may be made in the present application without departing from the spirit and scope of the application. Thus, if such modifications and variations of the present application fall within the scope of the claims of the present application and their equivalents, the present application is intended to include such modifications and variations as well.

Patent Citations (5)

Publication number	Priority date	Publication date	Assignee	Title
CN106294887A *	2016-10-24	2017-01-04	北京亚控科技发展有限公司	The object that objective world is existed based on space-time and the description method of event
WO2018213702A1 *	2017-05-19	2018-11-22	Ptc Inc.	Augmented reality system
	2018-03-21	2019-09-26	Swimc Llc	Predicting using digital twins
WO2020070758A2 *	2018-10-03	2020-04-09	Tata Consultancy Services Limited	Systems and methods for simulation of humans by human twin
CN114373047A *	2021-12-29	2022-04-19	达闼机器人有限公司	Method, device and storage medium for monitoring physical world based on digital twin

Family To Family Citations

* Cited by examiner, † Cited by third party

Similar Documents

Publication	Publication Date	Title
CN108885634B	2022-09-09	Retrieval method for data object based on space-time database
CN106446278B	2018-07-20	A kind of search method to data object based on space-time database
CN101241354A	2008-08-13	Event triggered data capture via embedded historians
KR100529661B1	2005-11-21	Object integrated management system

Publication	Publication Date	Title
CN106407468B	2018-08-28	A method of description things space attribute is simultaneously searched based on the description
CN115017141A	2022-09-06	Digital twinning method, device and equipment for event full life cycle
CN115470195A	2022-12-13	Index data automatic calculation method and device fusing dimension models
CN115809302A	2023-03-17	Metadata processing method, device, equipment and storage medium
CN104820700B	2018-07-20	Processing method of unstructured data of transformer substation
Stefanovic et al.	2008	Methodology for modeling and analysis of supply networks
CN115080543A	2022-09-20	Event plan state digital twin method, device and equipment
CN115017137A	2022-09-06	Digital twinning method, device and equipment for personnel full life cycle
CN113641651A	2021-11-12	Business data management method, system and computer storage medium
CN110059967B	2021-02-23	Data processing method and device applied to city aid decision analysis
CN115145896A	2022-10-04	Entity object plan state digital twin method, device and equipment
CN117216056A	2023-12-12	Service data storage method, device, equipment and storage medium
CN115114268B	2023-08-11	Method, device and equipment for organizing future state twinning
CN114782010A	2022-07-22	Demand file processing method and device, storage medium and equipment
JP4079990B2	2008-04-23	Generation method of object integrated management system
CN113157664B	2023-08-25	Data grading and authorizing method and system based on grading identification
CN109840184B	2023-05-30	Scheduling method, system and equipment for operation display of power grid equipment
CN115017138A	2022-09-06	Personnel plan state digital twin method, device and equipment
CN115270419A	2022-11-01	Twin method, subscription method and system for real-time event current state
CN115114267A	2022-09-27	Digital twinning method, device and equipment for full life cycle of organization mechanism
JPH08234977A	1996-09-13	Manifold progress management system for software project

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title

Application	Priority date	Filing date	Title
CN202210767442.3A	2022-06-30	2022-06-30	Digital twinning method, device and equipment for personnel full life cycle

Applications Claiming Priority (1) ▲

Application	Filing date	Title
CN202210767442.3A	2022-06-30	Digital twinning method, device and equipment for personnel full life cycle

Legal Events ▲

Date	Code	Title	Description
2022-09-06	PB01	Publication	
2022-09-06	PB01	Publication	
2022-09-23	SE01	Entry into force of request for substantive examination	
2022-09-23	SE01	Entry into force of request for substantive examination	